Conducting Research in Financial Planning

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The goal of a scientist in the field of financial planning is to gain a better understanding of how individuals use their scarce resources to get the most out of life. This involves investigating how individuals currently use existing resources, predicting how they will respond to a change in circumstances, and using theory to guide recommendations. The good news for financial planning scholars is that household finance research is wide open for exploration. Many questions still need to be answered about what people actually do with their money, and practitioners are constantly searching for the best strategies to recommend to their clients.

A wide open field for exploration is exciting. But the lack of well-worn research paths can make the selection of appropriate empirical methods (and even a topic) a challenge for a new researcher. This chapter provides a very broad introduction into financial planning research for new scholars.

There are two fundamental types of financial planning research. As noted by Campbell (2006) and Hanna, Fan, and Chang (1995), the first type answers what people should do with their money. This is known as normative research. Practitioners are often most interested in normative research because they want to know which planning strategies are the best to recommend to clients.

The second type answers what people actually do with their money. This is known as positive research. Positive research is the most common type of research in academic journals. Positive financial planning research is a social science because the researcher is observing how human beings make decisions.

This also makes positive research fun because humans do a lot of interesting things that do not align with the predictions made in normative research. The fact that humans make predictable mistakes is also of interest to practitioners who want to know how their client will likely behave when given advice.

Normative Research

All professions are built on a foundation of knowledge that defines best practices. Financial planning draws from theories developed primarily from the fields of economics and finance, such as utility theory, life cycle theory, and modern portfolio theory (MPT), to develop a set of consistent recommendations that are in the best interest of a client. The purpose of normative research is to apply existing theories to answer a research question.

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J.J. Xiao (ed.), *Handbook of Consumer Finance Research*, DOI 10.1007/978-3-319-28887-1_9

Bengen (1994) wrote a highly useful and popular article that explored how much a retiree could safely withdraw from a retirement account during each year of retirement. This article created the popular 4 % rule practiced by many financial planners. The article is an example of a type of normative research that appears in the financial planning literature.

All normative research starts with an objective function. In Bengen's article, he was concerned with estimating the maximum amount a retiree could have withdrawn from a retirement account each year without running out of money over a 30-year time period. The objective in this case was to not run out of money. The objective of spending the same amount after inflation each year in retirement is related to life cycle theory in economics.

Economic theory uses a utility function that captures the relationship between money and satisfaction. The traditional risk-averse (concave) utility function makes a lot of sense. When considering a two-year period, it says that individuals get more happiness from spending $60,000 per year than from spending $20,000 in one year and $100,000 in the next. It is the foundation for the concept of risk tolerance which explains when taking risks makes sense and how much risk individuals should optimally take and why people both invest and buy insurance. It is even possible to account for behavioral preferences by adjusting the utility function. To get a normative article published in an academic journal, the researcher will probably have to estimate a model that maximizes utility as the objective function. Practitioner journals are more receptive to objective functions that are more intuitive to a financial planner.

A new scholar who is not used to working with utility functions might be intimidated by the process, but it is really not that hard. A student can even use a spreadsheet to create highly complex utility maximization models that estimate how much a household should spend each year in retirement or how much a worker should save.

After stating an objective function, assumptions need to be specified to model a normative analysis. Among others, these assumptions often include the household's utility function, the length of life, returns on financial assets, financial product characteristics, tax rates, and asset management fees. It is important to understand that the optimal financial strategy estimated during the analysis will be very sensitive to the assumptions included in the model.

If a study assumes historical stock returns in its analysis, what happens if stock returns in the future are lower? Will the recommendations fall apart? This is one of the reasons financial researchers are careful to consider the robustness of their recommendations. A thorough normative analysis will consider a range of realistic assumptions and then test how changing these assumptions will affect the outcome.

Always use the assumptions that are most appropriate for the research question being addressed. For example, many financial planners work with clients who are in the top tax bracket and are investing a large portion of their portfolio in taxable accounts. Most individuals, however, haven't exhausted their tax-sheltered savings opportunities and will have the majority of their investment assets in a 401(k) or an IRA. Wealthier people will be generally more risk tolerant, while average workers are more risk averse. Most mutual funds in retirement accounts have significant expenses and the account itself may have fees. Use the assumptions that are most likely to result in a useful recommendation for the audience.

It is important to remember that a lot of normative work has already been done by economists. Writing a normative paper that adds to the existing literature means spending time searching through the prior literature for articles that try to answer a similar research question. There are dozens of articles that estimate optimal household portfolios, tax efficient investments, retirement savings and spending strategies, annuitization, planning strategies for a client with behavioral preferences, the implications of joint decision making in a marriage, optimal estate planning, etc. These articles need to be read and understood to do good financial planning research. Much of the existing normative research in economics and finance is highly theoretical. It is imperative to understand this theory to do good normative research. A good way to do that is to spend time carefully reading the

theoretical sections of normative papers and then replicating the analysis. Once understood, there are many opportunities to extend existing analyses to evaluate best practices under specific client conditions when publishing articles in journals that cater to practitioners. For example, an award winning article in the *Journal of Financial Planning* (Blanchett, 2014) employs the same data and similar methodology to Hurst (2008) in order to answer practical questions about whether practitioners can anticipate changes in spending as retirees age.

Positive Research

The most common type of financial planning research uses household data to explore research questions about how people behave. The purpose of positive research is to test theories used to make financial planning recommendations. In this manner, positive empirical research lends support to theories used to derive the normative recommendations to practitioners.

The purpose of science is to propose theories about how the world works and then to test these theories through systematic observation. An academic doing financial planning research is either using theories to build recommendations or using observed data to test the applicability of these theories to human behavior.

There are a number of theories that can be used to explain and predict household financial behaviors. One of the most important is utility theory. The main assumption of utility theory is that people make financial decisions that will maximize their satisfaction. Over a lifetime, this means that people will make decisions which maximize their discounted expected utility from consumption within each future time period that they are alive. Since planning by definition means considering the future, the life cycle hypothesis (Ando & Modigliani, 1963), which applies utility theory to intertemporal decision making, should be considered the foundation of positive research. Life cycle theory predicts that individuals will base saving and spending decisions on their impact on consumption over time, and a concave utility function will motivate people to prefer consumption that is about the same each year.

Almost every research question in financial planning relates to the life cycle theory. People save for retirement because they don't want their spending to drop sharply after they stop working. People buy annuities because they're worried about the utility consequences of running out of money in old age. People prefer less risky investments because they are concerned about the possibility of spending less in the future after a bear market. A highly useful first step in positive research is to search articles that explain life cycle theory. A good example is Attanasio and Weber (2010) in the *Journal of Economic Literature*, which in addition to *Journal of Economic Perspectives* can be an excellent source for literature reviews on household finance theories.

There are a number of other important theories used by researchers in the field of financial planning. MPT (Markowitz, 1952) is used to help us understand investment behavior. Behavioral theories such as prospect theory (Kahneman & Tversky, 1979) or hyperbolic discounting (Laibson, 1997) are surprisingly useful in predicting how households actually behave. Human capital theory (Becker, 1965) explains why people invest in an education or become financially literate. Household bargaining models (Gray, 1998) help explain why wives who earn more than their husbands are the primary financial decision maker in younger households. When beginning a positive analysis, make sure to be aware of all the theories that are related to the research question.

Once there's an understanding of how theory informs the research question, the process of writing a review of existing empirical literature can begin. If the research question relates to spending on health care in retirement, then research that estimates the demand for health care services in general, and specifically to health care spending that increases in old age needs to be collected. This will help develop an understanding for how insurance affects health care spending, and who is more likely to have health insurance.

A good strategy when developing an empirical analysis is to imagine all the general topic areas that are related to the research question.

For example, health insurance, health expenditures by demographic group and age, public health insurance programs, and so on. Create a file for each topic and save related articles during the literature search. The more search that's done up front, the easier it is to identify unique contributions to the literature and justify why the research is important. Don't skimp on the literature review—many a new researcher's days are wasted because they dive right into an analysis of a research question that someone else has already answered.

Usually a researcher has a data source in mind before embarking on a literature review (it's certainly good to know if a research question can be answered with existing data before spending time on a literature review). There are some exciting national data sources in the USA that provide detailed household-level information, which can be used to answer important financial planning questions. Another good time investment a new researcher can make is to scan the codebooks of popular nationally representative data sets that contain household finance information, and in particular new modules which contain questions that other researchers haven't yet explored. If thinking of research ideas becomes troublesome, spending an hour reading though survey questions will likely do the trick.

An Overview of Financial Planning Research Areas

Since financial planning is a new research area, there are few academic journals that specifically address issues directly related to the financial planning profession other than *Journal of Financial Planning*. Other journals, however, publish personal finance research such as the *Journal of Financial Counseling and Planning*, *Financial Services Review*, and *Journal of Personal Finance*. Personal finance research can find its way into economics and finance journals at all ranges of quality. When approaching a financial planning research topic, you'll need to explore all of these journals to locate the current research on a topic. And don't just rely on someone else's literature review since they are often intentionally brief and tend to cite seminal articles on a topic rather than a comprehensive list of related literature.

Saving

Both normative and positive research in saving use the life cycle hypothesis to help understand when individuals are most likely to save, and to build models that estimate optimal savings behavior given expected lifetime earnings and consumption preferences. Two articles that provide excellent introductions to life cycle theory are Hanna et al. (1995) and Yuh and Hanna (2010).

Hanna et al. (1995) show how the expected growth in earnings, risk tolerance, and real interest rates impact optimal saving at different ages. In a simple normative model, the article explains how life cycle theory does not necessarily imply a smooth consumption path. A high real interest rate, for example, induces households to spend less in the present and more in the future (and can explain why young households in a low interest rate environment are saving less). Yuh and Hanna (2010) provide a clear explanation of how to build an empirical model based on life cycle theory. The article is particularly useful at guiding expectations of direction of effect in an empirical model (for example, those with higher education expect higher future earnings and should save less early in life), and also illustrates the ways in which the normative life cycle theory doesn't match up with observed savings behavior (for example, homeowners should save less for retirement, but in reality they save more). Another excellent basic overview of life cycle theory is provided by Bodie, Treussard, and Willen (2007). Bodie et al. introduce uncertain asset returns and uncertain shocks to income, wealth, or consumption to the basic life cycle model. The authors explain how hedging instruments such as insurance or other financial products allow a household to smooth consumption by pooling the risk of uncertain events.

Borrowing

Borrowing is negative saving, so life cycle models provide a useful framework for explaining when it is rational to pull financial resources from the future into the present. Generally, this occurs when earnings temporarily dip below permanent income or early in the life cycle when a household is investing in human capital and durable goods. Normative research can include optimal mortgage refinancing (Agarwal, Driscoll, & Laibson, 2013) or how much a student should borrow for a college education (Avery & Turner, 2012).

Positive research on borrowing can provide insight into factors that increase consumer debt and self-control problems that lead to excessive borrowing. Among the most interesting theories that explain self-control problems is the hyperbolic consumption model (Angeletos, Laibson, Repetto, Tobacman, & Weiberg, 2001). Highly present-oriented consumers will rationally borrow heavily, resulting in downward-sloping life cycle consumption. Most of us, however, prefer a smooth or upward-sloping consumption path but have a hard time resisting the temptation to borrow. The application of high discount rates in the short run (myopia) and high discount rates in the long run leads to borrowing mistakes such as simultaneously revolving a positive credit card balance while holding a large emergency fund and saving for retirement. Other studies investigate credit mistakes that are clearly the result of a lack of financial sophistication, such as the failure to refinance a mortgage when current rates fall well below a consumer's current mortgage rate (Campbell, 2006). Understanding how low financial literacy and common behavioral biases affect credit behavior is essential when developing consumer counseling and planning techniques that hope to improve credit outcomes.

Household Portfolios

A number of recent normative studies have been published on optimal household portfolios. These include optimal asset allocation given a range of time horizons and risk tolerance (Campbell & Viceira, 2002), and how household portfolios should be tailored when income is uncertain, when borrowing constraints exist, and when most of a household's wealth is in housing (Cocco, 2005; Guiso, Jappelli, & Terlizzese, 1996). More practitioner-oriented research may focus on applied issues such as the impact of tax rates on optimal asset allocation inside and outside of sheltered savings accounts (Reichenstein, 2001).

Positive research in household portfolios focuses on factors that predict investment choice among households. For example, Yilmazer and Lyons (2010) investigate the impact of spousal bargaining power on the percentage of risky assets in the portfolios of men and women. Many of the differences in asset allocation decisions among demographic groups can be traced to wide variation in attitudes toward risk among more financially knowledgeable individuals (Grable, 2000). Campbell (2006) also found that equity allocation is much lower among households than normative theory would predict, and represents a significant welfare loss particularly among wealthier households that choose not to invest. This gap between normative and positive household portfolio allocation may be explained by the strong relation between financial literacy and stock market participation (van Rooij, Lusardi, & Alessie, 2011).

Risk Management

Kunreuther and Pauly (2005) provide an overview of insurance theory that describes when it is optimal for households to purchase a financial instrument in order to pool the risk of loss to wealth. For most young households, their most valuable asset is human capital. Products like disability and life insurance protect against a sudden, unexpected loss in the value of future earnings to the household. As households age, they accumulate other financial and non-financial assets and exposures to liability risk. These risks can be hedged through property and liability insurance. Older households are exposed to health risks and the risk of outliving assets. Examples of normative research include Brown and Finkelstein (2011), who estimate optimal purchase of long-term care insurance for men and women given

varying costs of protection, and Ibbotson, Milevsky, Chen, and Zhu (2007), who estimate optimal annuitization for households with varying bequest motives and levels of risk tolerance.

Positive studies estimate household demand for insurance products. As in other financial planning topics, gaps between normative and actual insurance demand can often be attributed to knowledge and risk preferences. Among the most important behavioral determinants of insurance demand are related to prospect theory (Kahneman & Tversky, 1979), which predicts that household will overinsure against small risks and underinsurance against large ones. Consumers will overpay for insurance against small losses such as the possibility of a $60 phone repair (Cicchetti & Dubin, 1994) while avoiding insurance that protects against a much larger loss such as long-term health care expenses (Brown & Finkelstein, 2011). Consistent with the hypothesis that knowledge impacts demand for insurance, Finke, Huston, and Waller (2009) find that households who rely on the expertise of a comprehensive financial planner are far more likely to own an adequate amount of life insurance.

Other areas of financial planning include investigations of the value of financial advice, financial literacy (and its relation to the topic areas described above), retirement (a component of saving), business ownership, charitable giving, and bequests. The broad range of topics provides many opportunities for financial planning scholars to stake out an under-researched area of expertise as the body of knowledge continues to expand in the profession. The following section provides an overview of the steps a financial planning scholar might take when beginning a positive research project that incorporates elements of neoclassical and behavioral theory.

Performing Positive Research: An Example

The Question

Now that the steps for approaching a research project in financial planning have been presented, let's discuss how they are applied to address a specific research question. MPT predicts that investors who are more risk tolerant will prefer portfolios that have a higher allocation to risky investments because they are willing to accept greater variation in consumption when spending their returns (Markowitz, 1952). Behavioral studies, however, suggest that many lose their nerve when they start losing money. The theory that predicts a magnified drop in utility following a loss is known as prospect theory. Prospect theory predicts that a dollar loss will have a much larger impact on utility than a dollar gain, a concept known as loss aversion (Kahneman & Tversky, 1979). A new study suggests that experiencing a bear market can affect an investor's willingness to take risks (Malmendier & Nagel, 2011). Understanding how past experiences with losing money predicts investors' sensitivity to losses in the future is important to developing theories of behavioral preference formation and can help practitioners anticipate how clients will behave after they have experienced a recent loss.

A good financial planning research question is direct and answerable with available data. The best written academic articles often have a very simple research question. In this example, we want to know whether negative market experiences affect an individual's aversion to losses in subsequent periods.

Hypotheses

The next step in the progression toward testing is establishing the hypotheses. To do this effectively the researcher must first perform a thorough review of the literature. An example of how the literature review informs the hypotheses is provided below. The hypotheses address the research question and provide a framework for interpretation of the empirical results. Our goal is to test whether negative market experiences impact future levels of loss aversion. Since this has not been established in the literature, we first form a null hypothesis that the treatment, in this case exposure to a significant market loss, has no impact on the outcome (subsequent loss aversion). This is an appropriate null hypothesis because we can test for the presence of a relation

between portfolio exposure to losses entering the great recession and loss-averse preferences in a subsequent period.

How does theory play a role in developing the null hypothesis in our example? MPT guides our expectations for individuals' risk preferences (Markowitz, 1952). According to the assumptions of MPT, portfolio allocations entering the great recession are a result of individuals' risk preferences, which are assumed to be stable and a product of their perfect understanding of the variation in outcomes that exists in their portfolio. In other words, we expect that individuals have already considered major market movements and assessed their level of comfort with such events when making portfolio allocation decisions. Under these assumptions we would not expect an event that was always a possibility to cause a change in risk preferences after it is experienced.

After establishing the null hypothesis we can focus on the alternative hypothesis. The alternative hypothesis is often the motivation behind a positive study and represents the possibility that individuals may behave differently than expected under a normative framework.

Using Literature Review to Inform the Hypotheses

The goal of the literature review should be to locate articles that have previously tested whether the experience of prior events affects individual preferences, particularly negative events. This may encompass economic studies of risk preferences and studies outside of economics that can help us understand why humans might change their willingness to take risk once they've actually experienced the pain of a loss. While financial planning research is often related to studies in economics and finance, the consideration of studies outside of economics and finance may be especially useful in helping the researcher gain a better understanding of scholarship that informs their research questions.

Normative economic models assume that individuals do not allow prior outcomes to affect subsequent risky choice. However, studies have found prior gains and losses do indeed influence risky choice in future periods (Barberis, Huang, & Santos, 2001; Thaler & Johnson, 1990). Malmendier and Nagel (2011) found that risk taking is strongly related to cohort stock return experiences, and more recent returns have a greater influence on risk taking than those experienced early in life. Hoffmann, Post, and Pennings (2012) found that, during the 2008–2009 financial crisis, investors' risk perceptions increased while their return expectations decreased.

According to prospect theory people interpret outcomes not as absolute values but as gains and losses, and they are loss averse relative to an anchored reference point. Prospect theory describes a behavior known as the reflection effect, or the tendency for individuals to treat gains and losses differently (Kahneman & Tversky, 1979). There is evidence that people anchor to a reference point, and take less risk in the presence of a prior loss compared to a prior gain (Barberis et al., 2001). Such reactions to prior losses may represent a change in risk perceptions that affect subsequent preferences (Loewenstein, Weber, Hsee, & Welch, 2001).

Evidence from the literature referenced above is not consistent with MPT. A behavioral theory, prospect theory, is introduced to explain how recent returns (and the resulting gains and losses) may be a significant predictor of subsequent risk preferences. Based on the findings presented in previous literature and a solid understanding of prospect theory, our alternative hypothesis is that there is a relationship (likely positive) between portfolio exposure to losses entering the great recession and individuals' level of loss aversion in subsequent periods.

Building and Testing the Model

Data The next step in the research process is to specify an empirical test of the question and hypotheses. While data selection may seem like the first step in the specification and operationalization of the model, it is a good idea to identify the data before solidifying the question. As stated earlier, it is important to know if a question is testable with available data before investing a significant amount of time into a study.

To determine the most appropriate data for a research question, consider the nature of the question. Is the study longitudinal or cross-sectional? If longitudinal, does the data need to be panel data? What is the population of interest, young households or older households? Should the data be nationally representative?

In our example, we are interested in how an experience in time A influences an outcome in time B at the individual level. This means we need data to be longitudinal (allows us to capture the effect of the treatment in time A on the outcome in time B) and panel (allows us to follow the same individuals in each time period).

In addition to being longitudinal and panel, we need to be able to use the data to measure our variables of interest. The two main variables of interest in our example are loss aversion (the dependent variable or DV) and exposure to market losses (the independent variable of interest or IVI). Once the specific requirements for the data have been identified we select the Health and Retirement Study (HRS) as the most appropriate data source.

Before moving on to the construction of the variables used to test the research question, it is important to understand the nature of financial data. Many of the variables commonly used in financial planning studies are constructed by manipulating multiple pieces of information. For example, let's say the research question requires that variable measuring individual's financial assets be included in the model. Many surveys will report the value of individual assets (such as stocks, bonds, mutual funds, etc.), total assets, or net worth. While these variables are very useful, they may not represent the exact variable of interest. In this case, the researcher will have to take what's available and rework it to develop the variable of interest. In addition to being able to create variables from existing information, it is also important to understand the distributional characteristics of financial data. Many of the financial variables are skewed (usually to the right) and require some form of transformation before being input into a statistical analysis.

Dependent Variable (DV) When operationalizing the DV it is important to understand how the variable has been measured in previous studies. Understanding the methods used in previous research, both normative and positive, can help guide the creation of the DV (if following a procedure used in previous research) or help determine the relevance and validity of a new measure. Either way, it is important to be sure that the DV measurement is theoretically sound and a valid representation of the desired variable.

To measure loss aversion in our example we use a special module on prospect theory available in the 2012 wave of the HRS. According to the theory and the measurement of loss aversion in previous studies we need, (1) a risky prospect and (2) the ability to evaluate how individuals react to losses in comparison to gains in that prospect. Both of these criteria are met by the data, giving us confidence that we can construct a DV that is theoretically sound and consistent with what we are trying to measure.

Independent Variables (IV) Up to now a mountain of articles have been read and used to provide insight into the variables that can be included in the model to predict the dependent variable. The goal is to estimate the impact of a treatment variable on an outcome variable, so we must do our best to isolate the impact of this variable by controlling for the many other individual characteristics that might impact the DV.

Our research question is whether negative market experiences affect an individual's aversion to losses in subsequent periods. This means that the IVI in our model is negative market experiences. To measure negative market experiences, we select an available variable that can proxy previous exposure to an investment loss. An individual's allocation to equities entering the great recession is an appropriate proxy since nearly all of these individuals lost money in the market crash.

The other independent variables in the model control for additional factors that may predict the DV. The independent variables included in the model should be based on theory and evidence

from prior literature. Here we include respondent risk tolerance and the demographic variables we believe are related to risk preferences. The demographics included here are age, wealth, income, education, cognitive ability, gender, and race.

Descriptive Statistics Descriptive statistics provide an opportunity to explore the data used in the empirical analysis and to provide an initial test of the hypothesis. Don't forget that the objective is to answer the original research question in statistical analyses. Descriptive statistics should not just provide an overview of the data—it should provide information that allows the researcher to evaluate the relation between the DV and the IVI.

Below we provide two examples of how to show the relationship between the DV and IVI using descriptive statistics. In the first example, we break loss aversion into three levels and report the mean equity allocation for each. To do this we first calculate each respondent's initial equity allocation, or percentage of financial assets invested in stocks in 2006. We then separate respondents into three groups based on their level of loss aversion in 2012 and calculate the mean equity allocation for each group.

The results in Table 9.1 show that respondents with the highest levels of loss aversion in 2012 had the highest allocation to equities in 2006. Consistent with our alternative hypothesis, this evidence suggests that greater exposures to loss led to higher levels of loss aversion in subsequent periods.

In the second example we split respondents into three categories based on their 2006 equity allocations and run cross-tabulations to determine the percentage of respondents in each category of loss aversion given their equity allocation entering the great recession (Table 9.2).

Table 9.1 The relationship between loss aversion and exposure to a negative experience entering the great recession

	Lowest loss aversion	Moderate loss aversion	Highest loss aversion
Mean equity allocation	23.16	30.24	41.72

This table was calculated by the authors using data from the 2012 wave of the HRS

Table 9.2 Crosstabs on loss aversion by exposure to a negative experience entering the great recession

	Percentage of respondents in each category		
Variable	Lowest loss aversion	Moderate loss aversion	Highest loss aversion
Lowest equity allocation	58.16	27.50	14.34
Moderate equity allocations	48.44	33.08	18.48
Highest equity allocations	28.67	39.55	31.78

This table was calculated by the authors using data from the 2012 wave of the HRS

For respondents with the lowest initial equity allocations we see that the majority (58.16 %) subsequently fall into the lowest loss aversion category. For respondents with the highest initial equity allocations we see that the majority (31.78 %) subsequently fall into the highest loss aversion category. Similar to Table 9.1 we provide evidence of a positive relationship between our DV and IVI, which is consistent with our alternative hypothesis.

In addition to reporting descriptive statistics on the DV and IVI, it is also important to report characteristics of the sample. This helps the reader verify consistency in characteristics between the population and the sample. If the sample has different characteristics than the population, it may be important to describe the differences and how they relate to the research question. For example, if testing a question where the sample is limited to stockholders, the income, wealth, and education of the sample may be higher than that of the population.

The Regression Analysis The first step in reporting regression results is making sure that the appropriate statistical technique is being used. The appropriate statistical method will be determined by the research question and structure of the data. Select the method that does the best job of testing the hypotheses. Do not choose the method that is most complex or most familiar—evaluate the statistical method based on whether it efficiently tests and answers the research question.

If an IVI impacts a linear change in the DV, the researcher will likely select a linear model, such as ordinary least squares (OLS) regression. If the goal is to measure the likelihood that an IVI will impact a dichotomous DV, the use logistic or probit regression analysis is more appropriate.

In our example, we want to know the linear relationship between exposure to market losses and subsequent loss aversion. This would make OLS an appropriate method. However, the distribution of our DV is not normal. This means we either need to transform or categorize the DV. We could log-transform the DV to normalize the distribution and use OLS regression, but our results would be difficult to interpret and carry less meaning. Alternatively, we could categorize the DV and evaluate the appropriateness of a dichotomous DV versus a categorical DV. If we want to evaluate whether exposure to market losses entering the great recession makes someone loss averse in subsequent periods (yes or no), a dichotomous variable would be appropriate.

We want to know how the *level* of loss aversion is affected by exposure to market losses entering the great recession because we want to understand an ordered relationship between the DV and IVI we need a categorical DV. By understanding the question and nature of the data we decide to use an ordered logistic regression (OLR) to test our question. OLR is appropriate because it allows us to measure the impact of each predictor variable on the likelihood of being in each successive response category. Here we place the DV values in descending order (high to low) so that when the OLR coefficients are estimated, a positive coefficient corresponds with a positive relationship (i.e., increased values of the respective variable produces higher levels of the DV) and a negative coefficient corresponds with a negative relationship (i.e., increased values of the respective variable produce lower levels of the DV).

Results, Conclusions, and Implications

After developing a model that best tests the hypotheses, the researcher must provide some context for delivering the results of their study. First, the results of the study should be reported without interpretation in the results section of the paper. Interpretation should only take place when writing the conclusions and implications of the research. Although it may be tempting for a financial planning scholar to jump right to the professional applications of the findings, it is important to first objectively present results and then place the results into the context of the current literature and theory (as well as practical application) in the conclusion.

Many financial planning studies have significant policy implications. Beshears, Choi, Laibson, and Madrian (2009), for example, present a normative theory, discuss behavioral deviations from that theory, and outline how the observed behavior could be improved through the implementation of policy. Their work on the importance of inertia in retirement savings decisions led to policy changes in the Pension Protection Act of 2006 which improved retirement savings outcomes for millions of Americans. Positive studies like this one often have important implication to both policy and the practice of financial planning.

Regardless of whether a financial planning study has professional or policy implications (or both), it is important for the researcher to remember that goal of the scientist is to add to the body of knowledge. The good news for financial planning researchers is that the field contains many exciting research opportunities that remain unexplored. We hope this chapter has been informative and will serve as an introductory guide to those interested in performing successful financial planning research for years to come.

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